



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/520,080	01/05/2005	Abdoulaye Doucoure	440993/PALL	2797
23548 7590 09/05/2008 LEYDIG VOIT & MAYER, LTD 700 THIRTEENTH ST. NW SUITE 300 WASHINGTON, DC 20005-3960				
EXAMINER MENON, KRISHNAN S				
ART UNIT		PAPER NUMBER		
1797				
MAIL DATE		DELIVERY MODE		
09/05/2008		PAPER		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/520,080

Applicant(s)

DOUCOURE ET AL.

Examiner

Krishnan S. Menon

Art Unit

1797

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1, 2, 4-11, 14, 16-18 and 32-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4-11, 14, 16-18 and 32-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 7/22/08
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Claims 1,2,4-11, 14, 16-18 and 32-36 are pending as amended 7/22/08 in the RCE of 1/10/08.

Claim Rejections - 35 USC § 103

Claims 1,2,4-11, 14-18 and 32-36 are rejected under 35 USC 103(a) as being unpatentable over the combination of Murahara et al (US 6,117,497), Gardella, Jr. et al (US 4,946,903) and/or Kawai et al (US 5,158,680).

These claims recite a microporous PTFE membrane with the following limitations in various combinations:

- first and second surface separated by a thickness
- CWST of at least 40,26,45,58 dynes/cm through the thickness of the membrane
- Wetting/dewetting ratio of at least about 0.7 for 2 or more cycles
- Both surfaces have F/C ratio of about 1.2 or more and O/C ratio in the range 0.01-0.15
- Water bubble point of at least about 33 or 45 or 75 psi
- Nominal pore size in the range 0.02-0.1 μm
- Membrane resists dewetting when contacted with hot water
- Less than 100 ppb extractables or 30 or 15 ppb metal extractables

Claims 32 and 33 are intended use of the membrane, which is also not patentable.

Murahara teaches a microporous PTFE membrane with pore diameter in the range 0.01-10 microns, and 20-80% porosity, impregnated with an aqueous solution and then exposed to radiation such as UV to make the membrane hydrophilic. See column 9, lines 1-65.

Murahara illustrates several examples of treating fluoropolymer films, both porous and non-porous, with various impregnating solutions and radiation energy of different intensities and duration, to obtain a wide spectrum of contact angles in the hydrophilic range. Examples 49 and 52 show microporous PTFE films treated with radiation, which also show the O/C and F/C ratio. The O/C and F/C ratio falls outside the range claimed, and are strongly hydrophilic. However, the O/C and F/C ratios appear to be functions of the solution used, and the intensity and duration of the radiation applied. Thus the O/C and F/C ratio could be controlled to the desired values of CWST range, which would be obvious to one of ordinary skill in the art, unless applicant can show otherwise.

Gardella teaches PTFE microporous membrane modified to increase hydrophilicity by plasma treatment, and shows three examples with O/C and F/C ratios. O/C ratio of examples I and II fall in the range claimed, and F/C ratio in example II falls close enough to the range. The range of F/C claimed is **about 1.2** or greater. Now "about 1.2" can mean a little less or a little more than 1.2. The F/C value in example II of 1.1 is little less than 1.2, and thus fall in the range of about 1.2 or greater. In addition, these three examples also show that the degree of substitution of the surface fluorine atoms, that is the F/C and O/C ratios, depend on the duration of exposure to radiation.

Art Unit: 1797

Thus, the 10 min duration is providing the lowest O/C ratio and highest F/C ratio. This reference in combination with Murahara teaches that the degree of substitution of fluorine atoms on PTFE surface can be controlled to the desired value of surface tension. Table I of Gardella below shows results from examples I-III, labeled "Modified PTFE".

TABLE I

Starting Material	RFOD Mix Composition	Pressure (mTorr)	Time (Min.)	Depth (Å)	CALCULATED ATOMIC RATIOS (ESCA)			
					C/O	C/F	F/O	Stoichiometry
Unmodified PTFE	—	—	—	—	∞	0.45	∞	C ₂ F _{2.1}
Unmodified PVDF	—	—	—	—	∞	1.0	∞	C ₁ F ₁
Modified PTFE	2% (vol) H ₂ O/98% H ₂	150	20	100	7.5	1.5	5.0	C ₁₃ F ₁₀ H ₁₀ O ₂
Modified PTFE	2% (vol) H ₂ O/98% H ₂	200	10	100	8.6	0.91	9.7	C ₁₇ F ₁₉ H ₁₃ O ₂
Modified PTFE	20% (vol) Methanol vapor/80% H ₂	150	30	100	3.0	1.5	2.0	C ₆ F ₄ H ₆ O ₂

The CWST values of Gardella is also about 40 to 50, and the corresponding contact angle values (see Table II) is about 110 for water. Compare this with the contact angles obtained in the examples of Murahara, which fall below 55!

Regarding the CWST through the bulk of the porous film, this would be inherent, since the porous film is impregnated with the solution, and the energy applied in a similar way as applicant discloses, at least in the Murahara reference. The Examiner submits that the effect of the radiation would be limited to the surface, up to a depth of the order of 100 Angstroms, in applicant's invention, as is in the references. Example 49 of Murahara teaches that prewetting the membrane with alcohol would make the membrane wettable. Kawai teaches making the PTFE membrane hydrophilic simply by wetting with alcohol etc.

The degree of extractables would be inherently as claimed - same material.

Thus, the claims are not patentable over the combination of these references, unless applicant can show otherwise with secondary evidence.

Regarding surface tension by contact angle, see the teaching Kuzowsky (US 5,437,900), column 9, lines 25-35, reproduced below:

The hydrophilicity or hydrophobicity of any surface is most commonly determined by measurements of the advancing and receding contact angles of distilled water droplets placed onto the horizontal surface in question as taught by ASTM D 724-45. Material surfaces having water droplet contact angles less than 90 degrees are considered to be hydrophilic while contact angles greater than 90 degrees indicate hydrophobicity. A typical porous expanded PTFE surface that has not been modified according to the present invention has a water droplet contact angle of about 120 to 160 degrees

Response to Arguments

Applicant's arguments filed 7/22/08 have been fully considered but they are moot – new grounds for rejection.

The declarations submitted are also moot - new grounds for rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krishnan S. Menon whose telephone number is 571-272-1143. The examiner can normally be reached on 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David R. Sample can be reached on 571-272-1376. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1797

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Krishnan S Menon/
Primary Examiner, Art Unit 1797